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Flying Operations

T-1A OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This AFI implements AFD 11-2, *Aircraft Rules and Procedures*, and AFI 11-202, Volume 3, *General Flight Rules*. Along with major command (MAJCOM) and local supplements containing local operating procedures, this instruction prescribes standard operational and weapons employment procedures to be used by all pilots operating Air Force T-1A aircraft. File a copy of all approved waivers with this instruction. **Attachment 1** contains a glossary of references and supporting information.

This instruction does not apply to the Air National Guard. MAJCOMs will forward proposed MAJCOM-level supplements to HQ AFFSA/XOF through HQ AETC/DOFV for approval prior to publication according to AFD 11-2. After approval and publication, one copy of each MAJCOM-level supplement will be sent to HQ AFFSA/XOF, HQ AETC/DOFV, and user-MAJCOM OPRs. Field units below MAJCOM level will forward a copy of their supplement to the parent MAJCOM OPR for post-publication review. See paragraph 4. of this AFI for guidance on submitting comments and suggesting improvements to this instruction.

Maintain and dispose of records created as a result of processes prescribed in this publication in accordance with AFMAN 37-139, *Records Disposition Schedule*. This instruction is affected by the *Paperwork Reduction Act of 1995* as amended in August 1997.

This instruction contains references to the following field (subordinate-level) publications which, until converted to department-level publications, may be obtained from the respective MAJCOM publication office: AETCMAN 11-203, *Mission Employment--T-1A Aircrew Procedures*, and AETCI 13-201, *Air-space Management and Runway Supervisory Unit Operations*.

Section A	Overview	4
1.	Pilot's Responsibility	4
2.	Deviations	4
3.	References	4

4.	Recommended Changes and Waivers	4
5.	Authorization	4
6.	Definition of Specific Terms	4
Section B	Normal Operating Procedures	5
7.	Preflight	5
8.	Publications and Additional Equipment	5
9.	Equipment Stowage	6
10.	Aircraft Systems	6
11.	Storage of Jump Seat	6
12.	Foreign Object Damage (FOD)	6
13.	Taxiing	6
14.	Team Sorties	6
15.	Fuels	7
16.	Weather:	7
17.	Performance Restrictions:	8
18.	Low Approach.	9
19.	Crosswind Limitations	9
20.	Crew Seat Change Procedures	9
21.	After Landing	9
Section C	Demonstration and Maneuver Parameters	9
22.	Altitudes	9
23.	Stalls	9
24.	Asymmetrical Thrust Demonstration	9
25.	Yaw Damper Failure Demonstration	9
26.	Flap Retraction Demonstration	9
27.	Unusual Attitudes	9
Section D	Night Restrictions	10
28.	Prohibited Maneuvers	10
29.	Pattern Restrictions	10
30.	Lighting	10
31.	Filing	10

AFI11-2T-1V3 1 MARCH 2000	3
Section E Low-Level Routes	10
32. Weather	10
33. Groundspeeds	10
34. Altitudes	10
35. Obstacle Clearances	11
36. Daylight Restrictions	11
Section F Airdrop	11
37. Altitude	11
38. Configuration	11
Section G Bomb Run	11
39. Parameters	11
Section H Formation Restrictions	11
40. Takeoff, Approach, and Landing	11
41. Maneuvering Restrictions	11
Section I Simulated Air Refueling	12
42. Turbulence Restriction	12
43. Separation	12
44. Weather	12
Section J Advisory Calls	12
45. Mandatory Calls for Pilot Not Flying (PNF)	12
46. Calls for Any Crewmember	13
Section K Simulated Emergencies	13
47. Procedures and Restrictions	13
Section L Instrument Flight Rules (IFR)	13
48. Pilot Weather Category (PWC)	13
49. Destination	13
50. Alternate	13
51. Remote or Island Destination	14
52. Takeoff	14
Table 1. Pilot Weather Categories (PWC) for T-1 Aircrews	14

53.	Penetration and Approach	15
54.	GPS Navigation	15
Section M	Command Operating Restrictions	16
55.	Overview	16
56.	Factors To Consider for Aircraft Malfunctions	17
57.	Waiver of Restrictions	17
Table 2.	T-1A Minimum Equipment and Systems Required (Excluding FCFs)	17
Attachment 1— GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION		19
Attachment 2— TOUCH-AND-GO PLANNING DISTANCES		22

Section A—Overview

1. Pilot's Responsibility. This AFI, in conjunction with other governing directives, prescribes T-1A procedures under most circumstances. However, it is not to be used as a substitute for sound judgment or common sense. The pilot in command (PIC) is ultimately responsible for the safe and effective operation of the aircraft.

2. Deviations. Deviations from the procedures in this AFI require specific approval of the MAJCOM director of operations (DO) unless an urgent requirement or an aircraft emergency dictates otherwise. In such a case, the PIC will take the appropriate action to safely recover the aircraft.

3. References. The primary references for T-1A operations are technical order (T.O.) IT-1A-1, *USAF Series T-1A Flight Manual*; AETCMAN 11-203; and this AFI. Training units may develop local standards from the procedures contained in these documents. Local standards may be used to augment initial and mission qualification training. Although local standards may expand these basic procedures, in no case will they be less restrictive.

4. Recommended Changes and Waivers. Submit suggested improvements to this AFI on AF Form 847, **Recommendation for Change of Publication**, to the parent MAJCOM through standardization/evaluation (stan/eval) channels. Parent MAJCOMs will forward approved recommendations to HQ AETC/DOFV. In accordance with AFPD 11-2, HQ USAF/XO is approval authority for changes or revisions to this AFI. The MAJCOM DO is waiver authority. Waiver requests may be submitted in message or memorandum format.

5. Authorization. Each pilot is authorized a copy of this instruction.

6. Definition of Specific Terms. For the purposes of this instruction, the term "student" refers to any crewmember enrolled in joint specialized undergraduate pilot training, joint specialized undergraduate navigator or naval flight officer training, pilot instructor training (PIT), or fixed-wing qualification training. The term "team" refers to any sortie where both the pilot and copilot seats are occupied by student pilots.

Section B—Normal Operating Procedures**7. Preflight:**

7.1. Minimum Briefing Times. For student syllabus sorties, minimum briefing times are determined according to the syllabus. For all other sorties, the minimum brief time will be 1 hour and 30 minutes prior to scheduled takeoff. The aircraft commander will determine briefing requirements for off-station sorties.

7.2. Briefing and Debriefing. The aircraft commander will brief all personnel on specific duties and responsibilities relating to safe mission accomplishment. Aircrews will use the appropriate briefing guides in AETCMAN 11-203 and brief applicable items before each mission. Briefing guides are a reference list of items that may apply to particular missions. Items listed may be briefed in any sequence. Those items covered by written squadron standards and understood by all participants may be briefed as "standard." These guides may be expanded as necessary to cover other important items of a flight. Brief only those items applicable to your mission in sufficient detail to prevent any misunderstanding between crewmembers.

7.2.1. Team students will not deviate from the briefed primary or alternate mission profile unless safety dictates otherwise.

7.2.2. The flight briefing will be structured to accommodate the capabilities of each pilot in the flight.

7.2.3. If appropriate, an alternate mission will be briefed for each flight. The alternate mission will be less complex than the primary and should parallel the primary mission. If the alternate mission does not parallel the primary mission, brief the specific mission elements that are different. Missions or events not briefed will not be flown. Mission elements events may be briefed airborne if practical and flight safety is not compromised.

7.2.4. All missions (student and continuation training) will be debriefed.

8. Publications and Additional Equipment:

8.1. On all sorties, one aircrew member will carry a complete set of current aircraft T.O.s (that is, T.O. 1T-1A-1 and T.O. 1T-1A-1-1, *Flight Manual, Appendix 1, Performance Data*).

8.2. If actual cruise time will be of short duration (approximately 15 minutes), the cruise checklist does not have to be accomplished. If aircrews are transiting between different airfields located in close proximity to each other (approximately 15 minutes) and remaining below transition level, the pattern checklist may be accomplished in lieu of the climb, cruise, descent, and before-landing checklists.

8.3. In addition to required publications, aircrews will carry an operational flashlight, an air navigation computer (CPU 26A/P) or electronic substitute, and a suitable terrain chart to cover the proposed route when flying outside the local area. Carry the flight information publications (FLIP) prescribed by local directives. On sorties that will be completed on or after official sunset, each aircrew member will carry a flashlight.

8.4. For overwater flight, a liferaft is not required if the only overwater portion of the flight is during the departure or approach phase or if the aircraft remains within gliding distance of land.

9. Equipment Stowage. Clothing and personal items should be stowed aft of the jump seat. Larger items of cargo will be carried in the cargo compartment, using tiedowns. Do not place large items in front of the crew entrance door or emergency escape hatch that will prohibit egress of the aircraft.

10. Aircraft Systems. Students will not fly team in aircraft requiring an operational check. Operational checks may be performed during student training sorties if the checks do not interfere with the training objectives.

11. Storage of Jump Seat. When there are only two crewmembers, the jump seat will remain locked in the stowed position. Required TOs must be stowed within arms reach of the seat-belted crewmembers. (Using the jump seat belts as restraints is allowed.) The jump seat is not a primary crew position.

12. Foreign Object Damage (FOD). To reduce the risk of FOD during ground operations:

12.1. Do not allow personnel to approach the crew entrance door or allow crewmembers to open the crew entrance door with both engines running. Personnel may enter and exit the crew entrance door with the right engine operating (and the left engine shut down). Use the appropriate TO 1T-1A-1 checklist.

12.2. Avoid taxiing too close behind other aircraft. Maintain a minimum interval of 150 feet.

12.3. Limit power during ground operations to approximately 70 percent N_2 in congested areas.

12.4. Avoid prop or jet blast from other aircraft.

12.5. To prevent scratching and abrasions to the windshield, do not place objects other than flight gloves on the flight deck glare shield.

12.6. Do not pass open containers of food or drink over the center console or circuit breaker panel.

13. Taxiing:

13.1. Do not taxi with less than 25 feet of wingtip obstacle clearance unless you are using a marshaller in conjunction with a wing walker at each affected wingtip. (This requirement does not apply at the home station when fixed taxi routes are marked and provide a minimum of 10 feet of wingtip clearance from permanent objects, other aircraft, fire bottles, or ground equipment.) When obstacles only affect one wingtip, the marshaller may also act as the wing walker and may direct the aircraft while monitoring the affected wingtip.

13.2. Never taxi with less than 10 feet of wingtip obstacle clearance.

13.3. Do not taxi staggered.

14. Team Sorties:

14.1. Prohibited Maneuvers. The following maneuvers are prohibited on team sorties:

14.1.1. Rolling takeoffs.

14.1.2. Touch-and-goes.

14.1.3. Air cycle machine (ACM) OFF takeoffs.

14.1.4. Takeoffs, departures, patterns, approaches, and landings flown from the right seat unless an emergency dictates otherwise.

14.1.5. Circling or low closed patterns.

14.1.6. Simulated emergencies of any type, to include simulated single-engine maneuvers, approaches, and landings and no-flap approaches, patterns, and landings.

14.1.7. Slow flight.

14.1.8. Approach to stalls or traffic pattern stall maneuvers.

14.1.9. Unusual attitudes.

14.1.10. Flight characteristic demonstrations.

14.1.11. Low-level or visual flight rules (VFR) navigation.

14.1.12. Formation.

14.1.13. Night takeoffs and landings.

14.2. Team Weather Restrictions. Team sorties may climb or descend through instrument meteorological conditions (IMC) if the ceiling is at or above 3,000 feet above ground level (AGL), visibility is at least 3 miles, cloud thickness is not more than 2,000 feet, and an alternate is not required at the home field. Team takeoffs, landings, and touch-and-go landings with greater than 15 knots of cross-wind are prohibited.

15. Fuels:

15.1. The T-1A will normally take off with a full fuel load from the home field. The aircraft commander or designated supervisor for team out-and-backs will decide whether to take off at the home field or out base with less than a full fuel load. Factors to be considered include mission requirements, aircraft performance, and weather conditions.

15.2. Do not refuel the aircraft with engines running.

15.3. Declare minimum fuel as soon as it can be determined that your fuel at touchdown will be less than 500 pounds (dual) or 700 pounds (team).

15.4. Declare emergency fuel as soon as it can be determined that your fuel at touchdown will be less than 300 pounds (dual or team).

15.5. After declaring minimum or emergency fuel, add the fuel status call and amount of fuel remaining (in minutes) to each new air traffic control facility. Once established in the local traffic pattern, add fuel status with each radio transmission.

16. Weather:

16.1. The T-1A will not be flown in areas of forecast or known severe turbulence. In addition, it will not be flown in areas of forecasted or reported severe icing or in freezing rain or drizzle.

16.2. Do not cruise or conduct multiple pattern operations in actual moderate icing conditions. Refer to TO 1T-1A-1 for applicable restrictions to flap settings when encountering icing conditions.

16.3. If required weather minimums cannot be maintained during a low level, abort the route according to applicable directives.

16.4. Do not exceed 30 degrees of bank in IMC unless safety of flight dictates otherwise.

17. Performance Restrictions:

17.1. Performance Data Restrictions. The minimum climbout factor for all takeoffs is 2.5. Reference zero will occur no later than the departure end of the runway for all initial takeoffs and touch-and-go departures.

17.2. Runway:

17.2.1. The minimum runway length for T-1A takeoffs is 6,000 feet or critical field length (CFL), whichever is greater.

17.2.2. The minimum runway length for full-stop landings is 6,000 feet or computed landing distance, whichever is greater.

17.2.3. The minimum usable runway length for touch-and-go landings must be equal to or greater than computed landing distance (charted or tabular) plus the applicable touch-and-go planning distance ([Attachment 2](#)), but never less than 6,000 feet. Touch-and-go planning distances reflect the most restrictive of the GO or STOP option from the appropriate decision point (flaps and throttles). From these points, the applicable touch-and-go planning distance allows acceleration, rotation, and climb to reference zero by departure end, or deceleration to stop within the runway remaining.

17.2.4. Intersection takeoffs are authorized as long as the runway remaining is at least 6,000 feet or CFL, whichever is greater. Performance data restrictions apply. The minimum usable runway is computed between arresting cables located on or above the runway surface.

17.2.5. Operations are prohibited where runway available is less than CFL.

17.2.6. The operations group commander may waive the requirements in paragraphs [17.2.1.](#) through [17.2.5.](#) on a case-by-case basis.

17.3. Tactical Overheads. Single-engine and no-flap tactical overheads are prohibited (simulated or actual). A tactical pattern is one turn to downwind and one turn to final.

17.4. Closed Pattern (Tactical or Rectangular). Minimum airspeed to begin the closed pullup is 160 knots indicated airspeed (KIAS). Maintain 160 KIAS minimum during the pullup. On downwind, maintain minimum speeds for fuel weight and configuration.

17.5. Bank Angles. Plan not to exceed 30 degrees of bank in the final turn or on final. Plan not to exceed 45 degrees of bank anywhere else in the traffic pattern.

17.6. No-Flap Landings. Do not practice no-flap full-stop landings.

17.7. Circling Approaches. Do not practice single-engine circling approaches or low-closed patterns.

17.8. Spacing. Plan to land on the runway center line with 6,000 feet minimum spacing behind other T-1A aircraft.

18. Low Approach. During low approaches, do not allow the aircraft to touch down. A restricted low approach is defined as no lower than 500 feet AGL or as directed by the controlling agency. Minimum altitude to initiate a practice single-engine go-around is 100 feet AGL.

19. Crosswind Limitations. The maximum crosswind limitation for takeoff and landing is 25 knots for a dry runway, 15 knots for a wet runway, and 10 knots for an icy runway.

20. Crew Seat Change Procedures:

20.1. Minimum altitude for seat changes is 1,000 feet AGL. This must be done during a noncritical phase of flight with a T-1A qualified pilot at the controls.

20.2. Crew seat changes on the ground will not be done with the engines running unless there is a pilot at the controls at all times (to guard the brakes). Seat changes with only two crewmembers on board will not be done with the engines running.

20.3. At the discretion of the aircraft commander, navigators may unstrap from the jump seat and (or) passenger seat to facilitate training during the low-level portion of navigator syllabus sorties.

21. After Landing. Do not perform any after-landing checklist items until you are clear of the active runway.

Section C—Demonstration and Maneuver Parameters

22. Altitudes. Complete approach to stalls, traffic pattern stalls, slow flight, and all other maneuvers or demonstrations above 5,000 feet AGL. The minimum altitude for VFR point-to-point navigation missions dictated by operational or training requirements is 3,000 feet AGL.

23. Stalls. Do not practice approach to stalls or traffic pattern stalls beyond the stick shaker.

24. Asymmetrical Thrust Demonstration. The demonstration must be conducted above 5,000 feet AGL. Yaw damper may be on or off. The high speed maneuver will be performed at 220 KIAS and the low speed portion at 140 to 150 KIAS. Calculate and use a maximum continuous thrust (MCT) to avoid overboosting the engines.

25. Yaw Damper Failure Demonstration. The demonstration must be conducted above 5,000 feet AGL and below flight level (FL) 280. The airspeed should be approximately 220 KIAS.

26. Flap Retraction Demonstration. The demonstration must be conducted above 5,000 feet AGL and below FL 200.

27. Unusual Attitudes. All unusual attitudes will be flown in day visual meteorological conditions (VMC) only. The maneuvers must be conducted above 5,000 feet AGL. Initiate recoveries above 130 KIAS and below 270 KIAS. Do not exceed 45 degree angle of bank (AOB). Maximum pitch attitudes are 25 degrees nose up and 20 degrees nose down. Compute and use an MCT to avoid overboosting the engines.

Section D—Night Restrictions

28. Prohibited Maneuvers. In addition to AFI 11-202, Volume 3, and its supplements, formation sorties, steep turns, unusual attitudes, traffic pattern stalls, slow flight, and low-level maneuvers are prohibited at night.

29. Pattern Restrictions. Night VFR rectangular patterns, tactical patterns, and visual straight-in approaches may be flown at fields other than the home field with the following restrictions:

29.1. Simulated emergency patterns and circling approaches may be flown at night if the ceiling is at or above 3,000 feet AGL and the visibility is at least 3 miles.

29.2. Fields used for this training must be "familiar"; that is, used routinely by the wing. For civil fields, there, must be an existing letter of agreement.

29.3. Visual and (or) instrument glidepath guidance must be available and used by the aircrew for all off-station night landings.

30. Lighting. If requested by runway supervisory unit (RSU) controllers, aircrew may turn off strobe lights during the hours of darkness while in the home base traffic pattern.

31. Filing:

31.1. For all night operations (unless required for syllabus-directed training), do not file to a destination other than the home station unless there is an operable straight-in approach with glidepath guidance. Aircrews may perform en route descents at facilities with no glidepath guidance if they descend no lower than the published minimum descent altitude (MDA). Visual descent path indicator or precision guidance systems constitute an acceptable glidepath guidance.

31.2. Do not file to a destination at night if a circling approach is the only available approach.

31.3. For night instrument flight rules (IFR) operations, alternates must have an operational instrument straight-in approach.

Section E—Low-Level Routes

32. Weather. Comply with restrictions in AFI 11-202, Volume 3, including MAJCOM and local supplements thereto. For locally published routes, slow routes (SR), and instrument routes (IR), aircrew will ensure a ceiling and visibility of at least 1,500 feet and 3 miles.

33. Groundspeeds. Maximum planned groundspeed on military training routes (MTR) is 300 knots. Do not exceed 330 KIAS. (Normal planned groundspeeds are 210 to 270 knots.)

34. Altitudes. Plan an altitude that gives adequate terrain and obstacle clearances. Low-level routes will be flown between 500 and 1,500 feet AGL. The minimum allowable on all low levels is 500 feet above the highest terrain within 2,000 feet of the aircraft. The minimum altitude AGL is 500 feet or as specified in FLIP (whichever is higher) for MTRs or slow-speed low-altitude training routes. The minimum altitude AGL is 500 feet for locally published routes.

35. Obstacle Clearances. Towers and other manufactured obstacles are more difficult to see than high terrain. Therefore, for towers on or near the route, plan to fly a minimum of 500 feet above the highest obstacle within 2 nautical miles (NM) of the aircraft. Once the obstacle is acquired visually and positively identified, the 2,000 feet clearance in paragraph 34. applies.

36. Daylight Restrictions. Enter the route no earlier than 30 minutes after sunrise (1 hour for mountainous terrain) and exit the route no later than 30 minutes prior to sunset (1 hour for mountainous terrain).

Section F—Airdrop

37. Altitude. A simulated airdrop maneuver is performed at a minimum of 1,000 feet AGL or 500 feet above planned route altitude. If accomplishing in the military operations area (MOA), the flight lead will determine an appropriate altitude. On the route, the wingman will never fly below lead or 500 feet AGL, whichever is higher. Whenever a flightpath conflict with lead exists, cross high in relation to lead.

38. Configuration. Airdrop configuration is 10 degrees flap setting and 130 KIAS minimum. (Airspeed may be higher as briefed by the flight lead.)

Section G—Bomb Run

39. Parameters. Plan a release altitude of 500 feet AGL for lead and 1,000 feet AGL for the wingman (or 500 feet above lead's altitude) at 270 knots groundspeed. If operational or mission requirements dictate flying the low-level route at other than 240 knots, the speedup airspeed should be 30 knots above the planned route speed. The wingman will be 1 NM in trail.

Section H—Formation Restrictions

40. Takeoff, Approach, and Landing:

40.1. Visual formation departures are not authorized when IMC will be encountered. Separate departures (a separation of 1 minute or as determined locally) will be made with a joinup on top.

40.2. Formation instrument approaches are not authorized.

40.3. Drag approaches are authorized to expedite formation recoveries, but they must comply with the separation criteria prescribed in AETCI 13-201.

41. Maneuvering Restrictions:

41.1. Practice lost wingman will be performed in day VMC above 5,000 feet AGL.

41.2. Formation is prohibited in IMC. Formations under an IFR clearance will maintain clear of clouds. Formations under a VFR clearance will maintain VFR cloud clearances in accordance with AFI 11-202, Volume 3. When flying MTR or slow routes, minimum weather requirements in the lead command supplement to AFI 11-202, Volume 3, apply.

41.3. The maximum number of aircraft in formation is two.

41.4. The maximum airspeed for number two during rejoins is 250 KIAS below 10,000 feet mean sea level (MSL).

41.5. The minimum altitude for formation position changes is 1,000 feet AGL.

Section I—Simulated Air Refueling

42. Turbulence Restriction. Do not fly precontact or contact positions in conditions exceeding light turbulence. Turbulence is limited to no greater than moderate up to the precontact position.

43. Separation. Receiver aircraft will maintain 1,000 feet below air refueling base altitude until visual contact is established with the tanker. Rendezvous closure will not be continued when the in-flight visibility is such that the receiver does not have visual contact with the tanker at 1 NM.

44. Weather. Weather criteria for flying precontact and contact positions is an in-flight visibility of 1 mile and clear of clouds.

Section J—Advisory Calls

45. Mandatory Calls for Pilot Not Flying (PNF). The PNF will make the following calls:

45.1. Nonprecision Approaches:

45.1.1. One hundred feet above MDA.

45.1.2. "Minimums" at MDA.

45.1.3. "Runway in sight." Call when the runway environment is in sight. Do not call too soon when obstructions to vision, such as fog, haze, low clouds, etc., are present.

45.1.4. "Go around." Call at the missed approach point if the runway environment is not in sight.

45.2. Precision Approaches:

45.2.1. One hundred feet above decision height (DH).

45.2.2. "Land." Call at DH if the runway environment is in sight and the aircraft is in a position for a normal landing.

45.2.3. "Go around." Call at DH if the runway environment is not in sight or the aircraft is not in a position for a normal landing.

45.3. Climbout:

45.3.1. Transition altitude.

45.3.2. At 1,000 feet below assigned altitude.

45.4. Descent:

45.4.1. Transition level.

45.4.2. At 1,000 feet above assigned altitude.

45.4.3. At 1,000 feet above initial approach fix altitude or holding altitude.

45.4.4. At 100 feet above procedure turn and final approach fix altitude.

45.5. Deviations. The PNF the aircraft will announce heading deviations, airspeed deviations of 5 knots or more below desired, and altitude deviations of 100 feet or more from desired.

46. Calls for Any Crewmember. Any crewmember will announce an altitude variation of 200 feet or more, an airspeed deviation of 10 knots or more below desired, or any potential terrain or obstruction clearance problem.

Section K—Simulated Emergencies

47. Procedures and Restrictions:

47.1. Do not practice simulated emergency takeoff, approach, or landing procedures unless an instructor pilot or flight examiner is seated at, and has immediate access to, aircraft controls.

47.2. Brief all airborne simulated emergencies prior to execution. Compound or multiple simulated emergencies are prohibited.

47.3. Maintain VFR cloud clearances when conducting simulated emergencies.

47.4. Do not practice a single-engine go-around after selecting 30 degree flaps.

47.5. Do not initiate practice simulated engine failure below 500 feet AGL during takeoff or landing.

47.6. Fly VFR single-engine and no-flap patterns only from the rectangular pattern.

47.7. Discontinue simulated emergencies if intercockpit communications cannot be maintained.

Section L—Instrument Flight Rules (IFR)

48. Pilot Weather Category (PWC). PWCs are designed to reduce the exposure of pilots with limited experience to the risks inherent during periods of low ceiling and visibility. **Table 1.** specifies PWC minimums. Before assigning a lower weather category, a PWC 1 pilot must evaluate the pilot's instrument proficiency. When calculating total time for the purpose of PWC, do not include student, undergraduate pilot training, or "other" flight time. Hours in an assigned aircraft may include all series or mission types of that aircraft.

49. Destination. Do not file to a destination unless the ceiling and visibility for the estimated time of arrival (ETA) (plus or minus 1 hour) is at or above the appropriate PWC or suitable published minimums, whichever is greater (**Table 1.**). **EXCEPTION:** If two or more suitable alternate airfields are available, aircrews may file flight plans to the home field when the terminal weather is forecast to be below published landing minimums. Aircrews will compute divert fuel for the most distant alternate.

50. Alternate:

50.1. For local flying operations, aircrews do not have to designate an alternate if all of the following conditions exist:

50.1.1. Departure and destination airfields are the same.

50.1.2. An instructor pilot or flight examiner is a crewmember.

50.1.3. Ceiling and visibility are reported and forecast to remain above 1,500 feet and 3 miles for estimated time en route plus 2 hours (AFFSA Vol 3/99002 and Federal Aviation Administration [FAA] Exemption #49F).

50.2. Weather requirements for an alternate requiring radar on the only suitable approach are the same as for an alternate without a published approach procedure.

51. Remote or Island Destination. Aircrews going to a remote or island destination will have fuel on board to hold 1 hour and 15 minutes (1+15) at the destination fix in place of an alternate. Forecast weather will meet the following restrictions for ETA plus 2 hours:

51.1. The prevailing surface winds, corrected for runway conditions (RCR), must be within limits.

51.2. The prevailing ceiling and visibility must be at or above published minimums for an available nonprecision approach (excluding approach surveillance radar [ASR]) or, if a precision approach is available, the ceiling and visibility may be intermittently below nonprecision approach minimums (excluding ASR), but not below precision approach minimums.

52. Takeoff. Takeoff minimums are specified in [Table 1](#). Base the decision to launch a local sortie on the existing weather and forecast for planned landing plus 1 hour. Base the decision to launch nonlocal sorties on the existing weather at takeoff time.

Table 1. Pilot Weather Categories (PWC) for T-1 Aircrews.

I T E M	A	B	C
	PWC (notes 1 through 6)	Minimum Flying Hour Criteria	Takeoff and Approach Ceiling and Visibility Minimums
1	1	150 rated hours primary flight time in assigned aircraft and 600 hours total rated time or 250 rated hours in the assigned aircraft and 450 hours total rated time.	Suitable published minimums or 300 feet and 1 mile (runway visual range 5,000 feet), whichever is greater.
2	2	Graduate of follow-on training (PIT or Combat Crew Training School [CCTS]) who does not qualify for PWC 1.	Suitable published minimums or 500 feet and 1.5 miles, whichever is greater.
3	3	A student enrolled in a formal follow-on training course (PIT or CCTS) after successful completion of a formal instrument evaluation in the assigned aircraft.	Suitable published minimums or 700 feet and 2 miles, whichever is greater.

NOTES:

- For the purposes of this table, the terms "pilot" and "aircraft commander" are synonymous. Document PWCs in the Air Force Operational Resource Management System (AFORMS) and Letter of Xs.

2. Assignment of PWC 1 status is dependent on the pilot's demonstrated knowledge and performance in flight under PWC 2 operations and in aircrew training devices with low-visibility capability. The commander of the flying squadron to which the pilot is assigned or attached will certify assignment to PWC 1 by signing the Letter of Xs. File the letter in the pilot's flight training folder.
3. PWC 1 is the minimum for normal training or support missions. When overriding mission requirements dictate, operations group commanders may individually authorize highly experienced PWC 1 pilots to use published approach minimums. PWC 1 minimums apply to all PWC 2 pilots for approaches at the home field.
4. If an instructor pilot is on board, aircrews may use his or her PWC.
5. If a pilot is noncurrent in instrument approaches, increase PWC minimums by one category. The pilot may regain currency with an instructor pilot at a dual set of controls.
6. Use the approach-end RVR to determine takeoff and landing criteria.

53. Penetration and Approach. Do not begin a penetration, en route descent, or approach unless existing ceiling and visibility meet the requirements of [Table 1](#). During actual IMC, a precision approach monitored by surveillance radar is the preferred approach. This does not prevent instrument practice for other types of approaches if the ceiling and visibility are at or above minimums for the approach being flown.

53.1. After beginning a penetration or approach and if weather is reported below the required PWC or published minimums (ceiling or visibility), the pilot may continue the approach to the PWC or published minimums, whichever is higher. The pilot may land if the runway environment is in sight and the aircraft is in a position to make a safe landing. In all cases, the pilot will comply with the last clearance received until obtaining a revised clearance.

CAUTION

The use of PWC minimums on a precision approach (ILS, precision approach radar [PAR]) may require pilots to execute a missed approach prior to the published DH. In these instances, on reaching PWC minimums and making the decision not to continue the approach, the pilot should start a climb immediately while proceeding to the nonprecision missed approach point (MAP). On reaching the nonprecision MAP, the pilot should continue with the published missed approach procedure.

53.2. When flying instrument approaches in VMC conditions, pilots may fly down to approach minimums if the runway environment is in sight when reaching applicable PWC minimums. Pilots must acknowledge reaching PWC minimums and state their intentions to their crewmembers if continuing to published minimums.

54. GPS Navigation:

54.1. The Rockwell Collins AVSAT 5000 GPS installed in the T-1A has been certified compliant with FAA TSO C-129a, Class B-1, for IFR GPS operations in the National Airspace System (NAS) (FAA-controlled airspace). All IFR operations from en route navigation through nonprecision approach are authorized provided the aircraft contains a current Jeppesen database. Compliance with

procedures and restrictions concerning GPS operations is mandatory. (See AFI 11-202, Volume 3, and lead MAJCOM and local supplements.)

54.2. T-1A aircrews may use GPS as the primary navigational source while flying under IFR in the NAS. MAJCOM review and approval of the Jeppesen database is required for IFR operations outside the NAS.

Section M—Command Operating Restrictions

55. Overview:

55.1. Mandatory Equipment and System Requirements for All Missions (Excluding FCFs).

The following is a list of equipment and systems required for all missions (paragraphs 55.1.1 through 55.1.18):

55.1.1. ACU and pressurization.

55.1.2. Navigation lights.

55.1.3. Anticollision beacon. **NOTE:** The tail-rotating beacon must always fully operate; wing strobes must operate for night missions.

55.1.4. Anticollision strobes. **NOTE:** The tail-rotating beacon must always fully operate; wing strobes must operate for night missions.

55.1.5. Landing lights. **NOTE:** Both lights must fully operate. Except when detrimental to safety, display during all pattern operations.

55.1.6. Anti-skid.

55.1.7. Oxygen system.

55.1.8. Emergency equipment.

55.1.9. Flight data recorder. **NOTE:** Do not take off with an inoperable flight data recorder unless waived by the operations group commander.

55.1.10. Stall warning system. **NOTE:** The stall warning system includes the stick shaker and supplemental stall indication system.

55.1.11. Very high frequency omnirange (VOR) and distance measuring equipment (DME) and tactical air navigation (TACAN).

55.1.12. High frequency (UHF) or very high frequency (VHF).

55.1.13. Angle of attack (AOA).

55.1.14. EFIS.

55.1.15. Flight management system (FMS).

55.1.16. Intercom system.

55.1.17. Rudder boost.

55.1.18. Static wicks. **NOTE:** If one or more static wicks are missing, the operations group commander may approve a one-time flight to return to home base.

55.2. Minimum Equipment and System Requirements at Other Than Home Station. **Table 2.** helps pilots determine the minimum systems required during flight or for takeoff at locations other than the home station.

55.3. Determining Aircraft Status. Missions originating from the home base will not normally launch with a known malfunction. Aircraft status is determined according to AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting*, and the lead command supplement thereto.

56. Factors To Consider for Aircraft Malfunctions. Once airborne, aircraft commanders must weigh all pertinent factors when deciding whether to continue or abort a sortie for an aircraft malfunction. Factors include weather conditions at home base and divert base, student's mission requirements, etc.

57. Waiver of Restrictions. Operations group commanders may waive the restrictions listed in the following tables on a flight-by-flight basis if there is no compromise of flight safety or Air Force directives. This authority may not be delegated below the operations group deputy commander.

Table 2. T-1A Minimum Equipment and Systems Required (Excluding FCFs).

I T E M	A	B	C	D	E
	Equipment or System Affected	Type of Mission (note 1)			
		Day VMC Local	Night VMC Local	Night/Day IMC Local	Cross-Country and Out and Back
1	Anti-ice systems (note 2)	yes	yes	no	no
2	Windshield heat (note 3)	yes (note 4)	yes (note 4)	no	no
3	Weather radar	yes	yes	no	no (note 5)
4	Wing inspection lights	yes	yes	no	no (note 6)
5	Radio altimeter (note 7)	yes	yes	no	no
6	Autopilot (notes 8 and 9)	yes	yes	no	no
7	Yaw damper (note 10)	yes	yes	no	no
8	TCAS (note 11)	yes	yes	no	no
9	ILS/LOC	yes	no	no	no
10	VLF/Omega/GPS	yes	yes	yes	yes
11	Windshield wipers	yes (note 12)	yes (note 12)	no	no
12	Clock (note 13)	yes	yes	yes	yes
13	Electronic dipstick (note 14)	yes	yes	yes	yes
14	Transponder (note 15)	yes	no	no	no
15	GPWS	yes (note 7)	yes	yes	yes (note 7)

NOTES:

1. "Yes" indicates the aircraft is acceptable for flight; "no" indicates it is not.

2. Do not fly in known icing conditions with inoperative systems. The anti-ice system includes two groups of subsystems: Group 1--wing anti-ice, horizontal tail anti-ice, horizontal tail de-ice, and engine anti-ice; and Group 2-- AOA, pitot, and static heat. If any item in Group 2 is inoperative, do not continue the mission.
3. Windshield heat includes both low and high positions.
4. Aircraft may be flown below FL 180.
5. Aircraft may be flown cross-country or out and back in VMC only.
6. Aircraft acceptable for daytime flights.
7. Required for low-level navigation only.
8. Required for IFR navigation training missions.
9. The autopilot must be operational if the crew duty day for either pilot will exceed 10 hours.
10. The yaw damper may be inoperative for local missions, but the maximum altitude on the mission is limited to less than FL 280.
11. The Traffic Alert and Collision Avoidance System (TCAS) may be inoperative for a day local VMC pattern-only sortie.
12. The windshield wipers must be operational when departure, destination, and filed alternate airfields (when required) are reporting or forecasting precipitation \pm 1 hour of ETD or ETA.
13. One clock must be operative for low-level, air-drop, and air-refueling missions. A personal clock (wrist or stopwatch) may be substituted at the aircraft commander's discretion.
14. The engine oil level must be checked manually.
15. The transponder may be inoperative for a day local VMC pattern-only mission with local air traffic control permission if in the IFR traffic pattern.

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DCS/Air and Space Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 11-2, *Aircraft Rules and Procedures*

AFI 11-202, Volume 3, *General Flight Rules*

AETCMAN 11-203, *Mission Employment--T-1A Aircrew Procedures* (projected to be AFTTP 3-XX)

AETCI 13-201, *Airspace Management and Runway Supervisory Unit Operations*

AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting*

T.O. 1T-1A-1, *USAF Series T-1A Flight Manual*

T.O. 1T-1A-1-1, *Flight Manual, Appendix 1, Performance Data*

Abbreviations and Acronyms

ACM—air cycle machine

AFFSA—Air Force Flight Standards Agency

AFORMS—Air Force Operations Resource Management Systems

AGL—above ground level

AOA—angle of attack

AOB—angle of bank

ASR—approach surveillance radar

CCTS—combat crew training school

CFL—critical field length

DH—decision height

DME—distance measuring equipment

DO—director of operations

ETA—estimated time of arrival

EFIS—electronic flight instrument system

ETD—estimated time of departure

FCF—functional check flight

FL—flight level

FLIP—flight information publication

FMS—flight management system

FOD—foreign object damage

GPS—global positioning system

GPWS—ground proximity warning system

IFR—instrument flight rules

ILS—instrument landing system

IMC—instrument meteorological conditions

IR—instrument route

KIAS—knots indicated air speed

LOC—localizer

MAJCOM—major command

MAP—missed approach point

MCT—maximum continuous thrust

MDA—minimum descent altitude

MOA—military operations area

MSL—mean sea level

MTR—military training route

NAS—National Airspace System

NM—nautical mile

PA—pressure altitude

PAR—precision approach radar

PIC—pilot in command

PIT—pilot instructor training

PNF—pilot not flying

PWC—pilot weather category

RCR—runway condition

RSU—runway supervisory unit

RVR—runway visual range

SL—sea level

SR—slow route

stan/eval—standardization/evaluation

TACAN—tactical air navigation

TCAS—Traffic Alert and Collision Avoidance System

T.O.—technical order

UHF—ultra high frequency

UPT—undergraduate pilot training

VFR—visual flight rules

VHF—very high frequency

VLF—very low frequency

VMC—visual meteorological conditions

VOR—very high frequency omnirange

Attachment 2

TOUCH-AND-GO PLANNING DISTANCES

NOTE:

The tables in this attachment ([Table A2.1.](#) through [Table A2.8.](#)) show the touch-and-go planning distances for several different gross weights (for example, 15,500 pounds, 12,000 pounds, etc.)

Table A2.1. Touch-and-Go Planning Distance for 15,500 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	*	1290	*	1250	*	1180	3000	1160	*	1270	*	1740
2	SL		30T	3010	2980	3010	3050	2980	3140	3030	3190	3150	3230	3650	3230
3			10F	2510	1120	2530	1130	2480	1150	2490	1160	2620	1170	*	1180
4			10T	2550	2620	2653	2740	2660	2740	2720	2810	2750	2840	3110	2940
5			0F	*	1440	*	1450	*	1470	*	1480	*	1500	*	1920
6			0T	3210	2700	3190	2760	3160	2790	3200	2840	3540	2880	4170	2940
7	PA	Flaps	30F	*	1210	2970	1150	2950	1090	*	1280	*	1640	*	2580
8	2,000		30T	2990	3130	3010	3170	3040	3200	3180	3310	3580	3370	4560	3410
9	feet		10F	2500	1150	2470	1160	2470	1180	2680	1190	*	1200	*	1790
10			10T	2690	2780	2720	2810	2770	2860	2800	2890	3020	2920	3980	2960
11			0F	*	1470	*	1480	*	1500	*	1520	*	1720	*	2880
12			0T	3130	2850	3090	2880	3080	2930	3530	2960	4020	3000	5230	3030
13	PA	Flaps	30F	2950	1080	2990	1090	*	1160	*	1640	*	2520	NA	NA
14	4,000		30T	3040	3200	3100	3260	3120	3190	3630	3390	4540	3440	NA	NA
15	feet		10F	2460	1180	2440	1190	2550	1200	*	1220	*	1750	NA	NA
16			10T	2770	2860	2820	2920	2830	2920	3090	2960	3980	3020	NA	NA
17			0F	*	1500	*	1520	*	1540	*	1800	*	3080	NA	NA
18			0T	3040	2880	3060	2960	3340	2950	4150	3030	5470	3080	NA	NA
19	PA	Flaps	30F	2960	1110	3120	1130	*	1420	*	2430	NA	NA	NA	NA
20	6,000		30T	3190	3370	3220	3390	3460	3460	4510	3500	NA	NA	NA	NA
21	feet		10F	2430	1200	2580	1220	2890	1230	*	1620	NA	NA	NA	NA
22			10T	2880	2990	2870	2960	2950	3050	3930	3080	NA	NA	NA	NA
23			0F	*	1540	*	1560	*	1580	*	2990	NA	NA	NA	NA
24			0T	3000	3050	3350	3030	3890	3090	5450	3120	NA	NA	N/A	NA

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab data to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.
5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

NA -- The takeoff flare cannot be computed due to an inadequate climbout factor.

Table A2.2. Touch-and-Go Planning Distance for 15,000 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	*	1220	*	1210	2910	1150	2870	1070	*	1230	*	1470
2	SL		30T	2920	3000	2930	3050	2930	3090	2970	3130	3070	3220	3350	3230
3			10F	2430	1100	2470	1120	2430	1130	2370	1150	2560	1160	*	1170
4			10T	2560	2650	2620	2710	2650	2740	2690	2780	2740	2840	2820	2840
5			0F	*	1430	*	1440	*	1460	*	1470	*	1480	*	1580
6			0T	2990	2720	2980	2730	2970	2780	3020	2810	3250	2880	3790	2880
7	PA	Flaps	30F	2890	1130	2870	1070	2870	1060	3050	1170	*	1390	*	2010
8	2,000		30T	2930	3090	2970	3130	3050	3220	3060	3230	3300	3310	3960	3340
9	feet		10F	2410	1130	2370	1150	2390	1160	2560	1180	2790	1190	*	1240
10			10T	2650	2740	2690	2780	2760	2860	2770	2860	2840	2940	3400	2970
11			0F	*	1460	*	1470	*	1490	*	1500	*	1530	*	2140
12			0T	2920	2780	2870	2810	2890	2900	3340	2880	3790	2990	4450	2970
13	PA	Flaps	30F	2860	1060	2890	1080	3070	1150	*	1380	*	1930	NA	NA
14	4,000		30T	3020	3180	3080	3250	3120	3290	3330	3340	3930	3390	NA	NA
15	feet		10F	2380	1160	2360	1180	2520	1190	2800	1200	*	1220	NA	NA
16			10T	2750	2840	2770	2860	2810	2910	2860	2950	3380	2990	NA	NA
17			0F	*	1490	*	1500	*	1520	*	1540	*	2070	*	*
18			0T	2880	2880	2840	2880	3230	2960	3750	2970	4430	3030	6460	4040
19	PA	Flaps	30F	2870	1090	3010	1110	*	1330	*	1890	NA	NA	NA	NA
20	6,000		30T	3120	3290	3170	3340	3330	3410	3930	3530	NA	NA	NA	NA
21	feet		10F	2320	1190	2480	1200	2740	1220	*	1230	NA	NA	NA	NA
22			10T	2810	2910	2860	2950	2890	2990	3360	3100	NA	NA	NA	NA
23			0F	2830	1520	*	1540	*	1560	*	2280	*	*	NA	NA
24			0T	2890	2960	3290	2990	3610	3050	3690	3090	6500	4040	NA	NA

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on;" anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

NA -- The takeoff flare cannot be computed due to an inadequate climbout factor.

Table A2.3. Touch-and-Go Planning Distance for 14,500 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2800	1140	2790	1090	2780	1040	2810	1040	*	1170	*	1370
2	SL		30T	2820	2980	2870	3030	2890	3050	2930	3090	2970	3130	3210	3170
3			10F	2370	1100	2340	1110	2310	1120	2330	1130	2470	1150	2700	1160
4			10T	2560	2640	2600	2690	2620	2710	2650	2740	2690	2780	2720	2810
5			0F	*	1410	*	1430	*	1450	*	1460	*	1470	*	1490
6			0T	2860	2690	2860	2750	2830	2780	2880	2790	3050	2810	3510	2850
7	PA	Flaps	30F	2790	1060	2790	1040	2770	1050	2970	1130	*	1290	*	1660
8	2,000		30T	2890	3050	2930	3090	2970	3130	3010	3170	3170	3220	3580	3270
9	feet		10F	2320	1120	2310	1130	2270	1150	2490	1160	2680	1180	*	1190
10			10T	2620	2710	2650	2740	2690	2780	2740	2820	2780	2870	3070	2910
11			0F	*	1450	*	1460	*	1480	*	1490	*	1500	*	1800
12			0T	2840	2800	2820	2780	2810	2820	3180	2850	3530	2910	4070	2940
13	PA	Flaps	30F	2770	1050	2790	1070	2980	1100	*	1240	*	1640	*	2830
14	4,000		30T	2970	3130	3020	3180	3070	3240	3160	3290	3600	3350	4830	3420
15	feet		10F	2310	1150	2270	1160	2450	1180	2650	1190	*	1200	*	2080
16			10T	2700	2790	2740	2820	2780	2870	2830	2920	3070	2950	4280	2990
17			0F	*	1480	*	1490	*	1510	*	1520	*	1810	*	*
18			0T	2810	2820	2790	2850	3020	2930	3520	2940	4120	2970	5430	3070
19	PA	Flaps	30F	2790	1080	2910	1090	3100	1140	*	1620	*	2660	NA	NA
20	6,000		30T	3070	3240	3120	3290	3180	3350	3620	3440	3700	3530	NA	NA
21	feet		10F	2260	1180	2400	1190	2570	1200	*	1220	*	1890	NA	NA
22			10T	2770	2860	2830	2920	2860	2950	3070	3000	4130	3050	NA	NA
23			0F	2780	1510	*	1530	*	1540	*	1860	*	3010	NA	NA
24			0T	2840	2900	2920	2970	3420	2970	4210	3010	5420	3060	NA	NA

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

NA -- The takeoff flare cannot be computed due to an inadequate climbout factor.

Table A2.4. Touch-and-Go Planning Distance for 14,000 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2720	1080	2730	1070	2710	1020	2730	1030	2870	1100	*	1320
2	SL		30T	2780	2940	2820	2980	2840	2990	2890	3050	2930	3090	3120	3130
3			10F	2300	1090	2300	1100	2260	1110	2260	1120	2390	1130	2620	1150
4			10T	2520	2610	2560	2640	2590	2680	2620	2710	2650	2740	2690	2780
5			0F	*	1400	*	1420	*	1430	*	1450	*	1460	*	1480
6			0T	2770	2640	2780	2700	2750	2700	2780	2780	2890	2790	3360	2820
7	PA	Flaps	30F	2710	1020	2720	1030	2710	1040	2890	1090	*	1210	*	1300
8	2,000		30T	2850	3000	2880	3040	2930	3090	2970	3130	3050	3170	3180	3200
9	feet		10F	2260	1110	2250	1120	2230	1130	2430	1150	2570	1160	2690	1180
10			10T	2590	2680	2620	2710	2650	2740	2700	2790	2740	2820	2770	2860
11			0F	*	1430	2690	1450	2690	1460	*	1480	*	1490	*	1530
12			0T	2700	2730	2710	2780	2740	2810	2960	2820	3360	2870	3750	2900
13	PA	Flaps	30F	2700	1040	2700	1050	2840	1070	*	1190	*	1400	*	2070
14	4,000		30T	2930	3090	2970	3130	3020	3180	3070	3220	3320	3330	4030	3370
15	feet		10F	2220	1130	2240	1150	2320	1160	2540	1180	2810	1190	*	1330
16			10T	2650	2740	2700	2790	2740	2820	2770	2860	2840	2940	3500	2940
17			0F	2680	1460	2660	1480	*	1500	*	1510	*	1530	*	2230
18			0T	2760	2820	2760	2820	2950	2880	3350	2910	3800	2990	4550	3000
19	PA	Flaps	30F	2720	1070	2820	1080	3060	1140	*	1380	*	1910	NA	NA
20	6,000		30T	3020	3180	3060	3220	3110	3270	3340	3330	3910	3420	NA	NA
21	feet		10F	2200	1160	2320	1180	2550	1190	2810	1200	*	1220	NA	NA
22			10T	2740	2820	2790	2870	2830	2920	2850	2940	3400	3020	NA	NA
23			0F	2650	1500	*	1520	*	1530	*	1550	*	2170	*	*
24			0T	2820	2880	3100	2930	3260	2920	2930	2980	4540	3060	6740	4330

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

NA -- The takeoff flare cannot be computed due to an inadequate climbout factor.

Table A2.5. Touch-and-Go Planning Distance for 13,500 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2640	1040	2640	1000	2640	1000	2680	1020	2750	1030	*	1200
2	SL		30T	2710	2860	2780	2940	2810	2960	2860	3020	2900	3070	2980	3110
3			10F	2230	1070	2220	1090	2200	1100	2230	1110	2280	1120	2500	1130
4			10T	2480	2560	2520	2610	2540	2630	2590	2680	2630	2730	2660	2760
5			0F	*	1390	*	1410	*	1420	*	1430	*	1450	*	1460
6			0T	2640	2600	2660	2660	2630	2690	2700	2730	2770	2780	3120	2790
7	PA	Flaps	30F	2640	1000	2630	1020	2620	1030	2780	1040	*	1170	*	1340
8	2,000		30T	2810	2960	2860	3020	2900	3070	2930	3090	2970	3130	3180	3170
9	feet		10F	2200	1100	2180	1110	2150	1120	2300	1130	2510	1150	2700	1160
10			10T	2540	2630	2590	2680	2630	2730	2650	2740	2700	2790	2740	2820
11			0F	*	1420	2600	1430	2600	1450	*	1460	*	1480	*	1490
12			0T	2630	2690	2670	2730	2730	2790	2870	2790	3160	2820	3510	2850
13	PA	Flaps	30F	2610	1030	2600	1040	2740	1050	2980	1140	*	1340	*	1830
14	4,000		30T	2890	3050	2930	3090	2970	3130	3010	3170	3220	3220	3750	3320
15	feet		10F	2140	1120	2150	1140	2280	1150	2500	1160	2690	1180	*	1190
16			10T	2620	2710	2670	2760	2700	2790	2740	2820	2770	2860	3240	2910
17			0F	2590	1450	2560	1460	*	1480	*	1500	*	1510	*	1880
18			0T	2710	2780	2740	2810	2810	2820	3200	2870	3500	2910	4160	2970
19	PA	Flaps	30F	2660	1060	2740	1070	2980	1100	*	1090	*	1670	*	2530
20	6,000		30T	2990	3150	3020	3180	3060	3220	3210	3290	3630	3370	4530	3420
21	feet		10F	2160	1150	2220	1160	2480	1180	2700	1190	*	1200	*	1820
22			10T	2700	2790	2740	2820	2790	2870	2820	2910	3100	2970	4020	3000
23			0F	2600	1480	2750	1500	*	1520	*	1530	*	1870	*	3010
24			0T	2780	2840	2810	2870	3100	2890	3660	2940	4190	3030	5360	3030

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

Table A2.6. Touch-and-Go Planning Distance for 13,000 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2580	1000	2590	990	2590	990	2610	1000	2680	1020	2860	1120
2	SL		30T	2670	2810	2710	2860	2780	2940	2800	2950	2840	2990	2890	3050
3			10F	2190	1060	2180	1070	2170	1090	2170	1100	2230	1110	2390	1120
4			10T	2450	2530	2480	2560	2520	2610	2520	2600	2590	2680	2620	2710
5			0F	*	1370	*	1390	2560	1410	2570	1420	*	1430	*	1450
6			0T	2550	2600	2580	2610	2600	2660	2620	2670	2690	2720	2950	2760
7	PA	Flaps	30F	2590	990	2570	1000	2560	1020	2710	1030	2850	1080	*	1270
8	2,000		30T	2780	2940	2800	2950	2840	2990	2890	3050	2930	3090	3070	3130
9	feet		10F	2170	1090	2130	1100	2110	1110	2240	1120	2370	1130	2610	1150
10			10T	2520	2610	2520	2600	2590	2680	2620	2710	2650	2740	2700	2790
11			0F	2560	1410	2510	1420	2510	1440	*	1450	*	1460	*	1480
12			0T	2600	2660	2620	2670	2670	2730	2750	2790	2990	2810	3310	2820
13	PA	Flaps	30F	2560	1020	2560	1030	2640	1040	2870	1070	*	1220	*	1510
14	4,000		30T	2840	3000	2890	3050	2930	3090	2970	3130	3060	3180	3390	3220
15	feet		10F	2110	1110	2130	1130	2190	1140	2410	1150	2580	1160	*	1180
16			10T	2590	2680	2640	2730	2670	2760	2700	2790	2750	2840	2900	2870
17			0F	2510	1440	2490	1450	2670	1460	*	1480	*	1500	*	1600
18			0T	2670	2730	2710	2780	2740	2810	3000	2840	3310	2900	3820	2930
19	PA	Flaps	30F	2570	1040	2710	1060	2870	1070	*	1200	*	1480	*	2090
20	6,000		30T	2930	3090	2990	3150	3030	3200	3080	3240	3400	3320	4050	3400
21	feet		10F	2130	1140	2210	1150	2400	1170	2580	1180	*	1190	*	1360
22			10T	2670	2760	2700	2790	2760	2860	2800	2890	2890	2940	3520	2970
23			0F	2520	1470	2700	1480	*	1500	*	1520	*	1560	*	2250
24			0T	2760	2820	2780	2840	3000	2910	3450	2940	3830	3000	4560	3050

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

Table A2.7. Touch-and-Go Planning Distance for 12,500 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2510	970	2520	970	2530	980	2550	990	2610	1000	2760	1050
2	SL		30T	2620	2760	2680	2820	2700	2850	2780	2940	2800	2950	2840	2990
3			10F	2130	1050	2130	1060	2130	1070	2130	1090	2170	1100	2310	1110
4			10T	2400	2480	2460	2550	2480	2560	2520	2610	2540	2630	2590	2680
5			0F	2470	1360	2500	1380	2490	1390	2540	1410	2610	1420	*	1430
6			0T	2480	2540	2550	2610	2560	2610	2610	2670	2620	2670	2830	2720
7	PA	Flaps	30F	2530	980	2520	990	2500	1000	2600	1020	2750	1030	*	1230
8	2,000		30T	2700	2850	2790	2950	2810	2960	2850	3000	2890	3050	2990	3090
9	feet		10F	2120	1070	2100	1090	2060	1100	2150	1110	2280	1120	2510	1130
10			10T	2480	2560	2530	2630	2540	2630	2590	2680	2620	2710	2650	2740
11			0F	2530	1390	2490	1410	2480	1430	2650	1440	*	1450	*	1460
12			0T	2560	2610	2600	2660	2630	2680	2670	2730	2900	2790	3150	2790
13	PA	Flaps	30F	2500	1000	2490	1020	2610	1030	2790	1040	*	1170	*	1410
14	4,000		30T	2810	2960	2850	3000	2890	3050	2930	3090	2970	3130	3250	3180
15	feet		10F	2060	1100	2070	1110	2180	1130	2350	1140	2510	1150	*	1160
16			10T	2540	2630	2590	2680	2640	2730	2670	2760	2700	2790	2770	2820
17			0F	2480	1430	2450	1440	2590	1450	*	1470	*	1480	*	1500
18			0T	2630	2680	2670	2730	2710	2780	2940	2810	3150	2840	3650	2900
19	PA	Flaps	30F	2510	1030	2590	1040	2780	1060	3010	1170	*	1430	*	1780
20	6,000		30T	2890	3050	2930	3090	2990	3150	3040	3200	3300	3240	3690	3290
21	feet		10F	2080	1130	2150	1140	2290	1150	2530	1170	*	1180	*	1190
22			10T	2640	2730	2670	2760	2700	2790	2750	2840	2810	2870	3180	2910
23			0F	2450	1450	2640	1470	*	1480	*	1500	*	1520	*	1920
24			0T	2730	2790	2750	2810	2800	2840	3310	2900	3680	2940	4180	2990

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.

Table A2.8. Touch-and-Go Planning Distance for 12,000 Pounds Gross Weight. (See notes 1 - 6.)

I T E M	A			B	C	D	E	F	G	H	I	J	K	L	M
	Flap Position			Temperature											
				-10 ° C		0 ° C		10 ° C		20 ° C		30 ° C		40 ° C	
				Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
1	PA	Flaps	30F	2450	940	2470	960	2490	970	2500	980	2540	990	2670	1000
2	SL		30T	2550	2680	2630	2770	2660	2800	2710	2860	2780	2940	2810	2960
3			10F	2090	1040	2090	1050	2100	1060	2090	1070	2120	1090	2230	1100
4			10T	2370	2450	2400	2480	2460	2550	2480	2560	2520	2610	2530	2610
5			0F	2420	1350	2420	1370	2420	1380	2420	1390	2530	1410	*	1420
6			0T	2460	2500	2500	2550	2540	2600	2560	2610	2610	2670	2710	2670
7	PA	Flaps	30F	2490	970	2470	980	2450	990	2560	1000	2690	1020	2870	1150
8	2,000		30T	2660	2800	2710	2860	2780	2940	2810	2960	2850	3000	2880	3040
9	feet		10F	2100	1060	2060	1070	2030	1090	2120	1100	2240	1110	2410	1120
10			10T	2460	2550	2480	2560	2520	2610	2530	2610	2590	2680	2620	2710
11			0F	2420	1380	2380	1390	2330	1410	2580	1430	*	1440	*	1450
12			0T	2540	2600	2560	2610	2610	2670	2630	2680	2770	2730	3000	2760
13	PA	Flaps	30F	2450	990	2430	1000	2540	1020	2720	1030	2870	1110	*	1330
14	4,000		30T	2780	2940	2800	2950	2850	3000	2890	3050	2930	3090	3130	3130
15	feet		10F	2030	1090	1990	1100	2130	1120	2290	1130	2430	1140	2670	1150
16			10T	2520	2610	2540	2630	2610	2690	2640	2730	2670	2760	2700	2790
17			0F	2370	1410	2320	1430	2540	1440	*	1460	*	1470	*	1480
18			0T	2630	2690	2630	2680	2670	2730	2840	2790	2990	2820	3460	2840
19	PA	Flaps	30F	2460	1020	2560	1030	2690	1040	2850	1060	*	1260	*	1470
20	6,000		30T	2850	3000	2890	3050	2930	3090	2970	3130	3100	3180	3350	3230
21	feet		10F	2050	1120	2130	1130	2250	1140	2400	1150	2620	1160	*	1180
22			10T	2610	2700	2640	2730	2670	2760	2700	2790	2740	2820	2900	2890
23			0F	2340	1440	2590	1460	2740	1470	*	1490	*	1500	*	1650
24			0T	2670	2730	2730	2790	2760	2820	3140	2850	3400	2880	3860	2930

NOTES:

1. If the additional runway exists, use the "T" (throttles) decision point.
2. Add value to flight manual total landing distance or tab date to determine touch-and-go runway length.
3. Data basis – flight test and flight manual.
4. Data is valid for an RCR of 23 (dry) or 12 (wet) and no wind. Headwind is considered a benefit.

5. Add 50 feet for each 1 knot of tailwind up to 10 knots.
6. ACM -- "on"; anti-ice--"off."

LEGEND:

F -- flaps (the go/no-go decision point).

T -- throttles (the go/no-go decision point).

* -- Both distances are the same. Use the "T" (throttles) decision point.